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AUTHOR McGrann, James M.; Lippke, Lawrence A.
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ABSTRACT

An ongoing project was funded to develop and demonstrate a computerized approach to operation and management of a commercial-sized farm. Other project objectives were to facilitate the demonstration of the computerized farm to the public and to develop individual software packages and make them available to the public. Project accomplishments through 1986 included development of the Stiles Farm's computerized management information system, education and training in microcomputer use, and software development and distribution. Documentation of information about the project had a number of important goals, including attracting attention of a wide audience of potential funding participants, fostering the progressive agricultural technology image of the Stiles Farm Foundation and the Texas A&M Extension Service (TAES) computerized systems, attracting participants in education and demonstration activities, and enhancing the ability of TAES to facilitate improved management through subject matter education and computer use of staff and clientele. An evaluation of results showed that (1) several areas of change on the Stiles Farm have led to direct increased income facilitated by the use of information from the management information systems, (2) participants in short courses indicated returns above course costs, and (3) software development and distribution have been accelerated through project effort. (Project materials are appended, including lists of software titles, agricultural software vendors, and 38 references.) (YLB)

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Texas Agricultural Extension Service

People Helping People

ED298260

YEAR 2000 COMPUTERIZED FARM PROJECT

FINAL REPORT

Submitted to the
W.K. Kellogg Foundation

By:
James M. McGrann
and
Lawrence A. Lippke

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Texas Agricultural Experiment Station
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The Texas A&M University System, U.S. Department of Agriculture and the County Commissioners Courts of Texas Cooperating

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A special recognition to Dr. Robert Kramer and Dr. Norman Brown, both Kellogg Foundation program directors during the project, who assisted in planning and implementing the project.

Gene Helms, Sam Webster and Ed Konop of Texs Instruments Incorporated coordinated the grant of thirty microcomputers to the project. Their grant made a major contribution to the educational effectiveness of the project.

Dr. O.D. Butler was very instrumental in initiating the project and provided ongoing support at the Stiles Farm. Mr. Calvin Rinn, the Stiles Farm Manager and Mrs. Rinn, the farm Secretary, greatly facilitated the implementation of the project at the Stiles Farm.

Jeff Johnson and Bob Dyer served as project coordinators at the Stiles Farm. The progress made in developing the Stiles Farm management information system and a favorable course learning environment is largely a product of their efforts.

Many Texas A&M University research and extension staff contributed to the accomplishments. Special recognition must go to the entire farm and ranch management extension staff who organized and implemented most of the training program.

System analysts David Riegel, Alan Davis and Clay Laird made a large contribution in software development and in just keeping everything operating in top form.

Drs. Roland Smith and Walter Walla gave essential administrative help that facilitated acquiring high quality staff to carry out the project.

For the graduate students that participated, Tim Powell, Jay Yates, Bill Babacz, and Robert H. Jenson, it is our hope that the experience gained through supporting the effort will benefit their future work as it did the project.

We want to thank Texas farmers and ranchers that inspired the project development. It is hoped that they and other agriculturalists continue to profit from the education activities of the project.

Lastly, the very professional secretarial support of Rosemary Schoenfeld and Roxanne Demel is greatly appreciated.

Year 2000 Computerized Farm Project Final Report

1.0 Introduction

This report summarizes the funding, accomplishments, evaluations and dissemination of results and ongoing activities for the W.K. Kellogg funded "Year 2000 Computerized Farm Project". The project was initiated December 1983. W. K. Kellogg funding ended December 1, 1986 but the project continues as an ongoing effort of the Texas Agricultural Extension Service (TAEX) of the Texas A&M University System.

The specific objectives of the project were as follows:

A. To develop and demonstrate a computerized approach to operation and management of a commercial sized farm.

B. To facilitate the demonstration of the computerized farm to the public through field days, farm visits, publications, and other educational media.

C. To make individual software packages, developed through the project, available to the public in Texas and nationally through the Texas Agricultural Extension Service's ongoing software distribution effort.

The project was funded through a $500,000 grant from the W.K. Kellogg foundation. Additional gifts and contract activities associated with the project amounted to $416,700 (see Appendix A). Staff time from the Texas Agricultural Experiment Station (TAES) and Texas Agricultural Extension Service also contributed to the project effort resulting in overall project support in excess of one million dollars.

The project accomplishments through 1986 are described in the three main areas of activities including (1) development of the Stiles Farm's computerized management information system (2) Microcomputer use education and training and (3) software development and distribution.

2.0 Project Accomplishments

2.1 The Management Information System

When the project was initiated at the Stiles Farm, a 3300 acre foundation farm, no formal management information system (MIS) existed on the farm nor were there any computer applications. Payroll and accounting were done off the farm with little feed back for management. A manual swine record system, although operational, did not supply timely, accurate information that could be used in production management. Over all, the MIS was less effective than most private commercial farms at this scale of operation.

The following additions to the Stiles Farm management information system have been made as a direct result of the Year 2000 Computerized Farm Project.

The implementation of each of these additions at the farm can be attributed to the involvement of and cooperation between Stiles Farm personnel and the TAEX employees.

- On-farm accounting including general ledger, payroll, and accounts payable using Datasphere's TERRA software
- Enterprise accounting using Datasphere's TERRA software
- Field records using Datasphere's TERRA software
- Enterprise budgeting using TAEX Microcomputer Budgeting Management System
- Computerized hog management system using FBS Sow Audit and Herd Audit which allows more timely reports than the previous hand records
- Computerized catfish records using the Mississippi State University Catfish Recordkeeping System
- Weather records from the automated weather station which are used by TAEX specialists in analyzing demonstration results
- Decision aids for the 1985, 1986, and 1987 USDA farm programs
- Detailed analysis of the swine and fish enterprises and of machinery purchase decisions
- Price records and graphs for cash and futures prices for relevant commodities

Aspects of the management information system which are just beginning or will begin soon include:

- Forage utilization records using TAEX Range and Livestock Management Information System
- Machinery management records system using TAEX software
- Asset depreciation and inventory using Datasphere's TERRA software
- Use of marketing tools, such as futures and options markets, which can now be used with improved market price information and cost of production projections

With the success generated through the Stiles Farm MIS, a similar MIS development effort was initiated on the Texas Agricultural Experiment Station's Plantation Farm in 1985. This 2500 acre beef cattle and crop farm MIS was developed along the same lines as the Stiles Farm. Computer applications in the areas of accounting and enterprise analysis have resulted in a reorganization for cost cutting and in improved management control.

Both of the farms' MIS efforts have not only contributed to farm income but also increased staff and management experience and improved the education capability of the University. These activities have created an environment where not only is the MIS used in demonstration, classroom and adult education, but also is used by professionals who teach their development and daily use. This activity adds credibility to the MIS Extension education efforts as well as provides a unique opportunity for practical application by professional staff.

2.2 Microcomputer Use Education and Training

A major focus of the project was user education and staff training. During the process of project development Dr. O.D. Butler and Dr. Perry Adkisson, who were administratively in charge of the farm, agreed to

build a training center at the Stiles Farm. This opened the opportunities for a unique teaching environment. Mr. Calvin Rinn, Stiles Farm manager, directed the building of the training center. Later, Texas Instruments Incorporated agreed to give microcomputers to the farm and center. With this contribution, the emphasis of the project shifted to user education, greatly expanding the success of the project. The following section describes the Stiles Farm Computer Training Center and project education activities.

The Stiles Farm Computer Training Center

The Stiles Farm Computer Training Center, built by the Stiles Farm Foundation as part of the support for the "Year 2000 Computerized Farm Project", is a permanent structure on the farm with a computer training center equipped by Texas Instruments Incorporated. The computerized training room is connected to the farm management offices, thereby easily facilitating participation in training activities by Stiles Farm management staff and demonstration of the computer application activities.

Since the opening of the Stiles Farm training center in June 1984, nearly 2000 farmers, ranchers, agribusiness representatives, extension professionals, researchers, and SCS staff have visited or participated in courses at the farm. There have been visitors from forty-nine states in the U.S. and six foreign countries. Eighteen intensive three day short courses have been taught at the farm as well as thirteen training courses for Extension Specialists in animal science, range science, and agricultural economics. Appendix B shows a log of the activities occurring at the Stiles Farm training center between June 1984 and December 1986.

Short Courses

A major focus of the project was on user and staff education by the Extension Farm and Ranch Management Project group. Three day short courses that focused on indepth subject matter and computer software use education. Appendix B identifies specific courses and attendance in different activities. Teaching materials and software used in the courses have been widely used by Farm and Ranch Management Extension Specialists in their education programs throughout the state.

In topic areas such as the beef cattle courses, the farm and ranch management specialist team was complemented by subject matter Extension specialists such as the beef cattle nutrition specialist or veterinarians. These interdisciplinary opportunities help strengthen working relationships and quality of education programs.

Short course participants evaluated each respective course upon shortcourse completion. On a rating scale of 1-10, more than 85% of the participants ranked the course 9 or above. Few Extension programs receive this favorable an evaluation, illustrating the quality of efforts by staff and the three day, hands-on approach effectiveness. A latter section of this report provides results of a follow up course evaluation.

Field Days

The annual Stiles Farm Field Day is a community activity that attracts over 1000 participants. Special activities demonstrating computer applications in management have been an active part of the field day each year. These awareness sessions provide exposure to potential application in management and to learning about available software and training programs.

The Stiles Farm MIS has been effectively used to generate economic analysis of different production activities for the Stiles Farm Field Day report provided to field day participants.

Staff Training

The training center has been used by Extension Staff from a number of program areas for staff training in subject matter and computer use. Staff from agricultural economics, agricultural engineering, animal science, veterinary medicine, entomology, range science, and home economics have used the center. In addition, the center has been used for county Extension agent training in computer use and in financial management.

Agribusiness Training

Two indepth training programs have been held specifically to meet agribusiness needs. One of the courses was a joint effort of Agricultural Engineering and Agricultural Economics, training John Deere salesmen how to use machinery management decision aids and reviewing results from computerized tractor research.

Dow Chemical salesmen participated in a three day short course taught by the farm and ranch management extension specialists in cooperation with range scientists. They learned how to use livestock, wildlife and brush control evaluation software to more effectively evaluate brush control on Texas ranches.

Both of these activities were well received and identified a potential for increased involvement in such joint education efforts with agribusiness.

Courses with National Audience

Three courses were held with national audiences present including two user training programs in the "Microcomputer Budget Management System Software" and one for veterinarians using the Cow-Calf Herd Health Management Record System software. Both of these programs were developed in part with W. K. Kellogg funding. In total, 30 states were represented by participants in these courses.

Soil Conservation Service Staff Training

The most active institutional participant in the training activity at the Stiles Farm was the Soil Conservation Service (SCS). During the report period

15 SCS staff members participated in three day short courses. Two separate education programs set up specifically for SCS staff involved professional staff and a group of administrators from Washington D.C. and Temple, Texas.

SCS also, through participation in various regional and national conferences, widely publicized the availability of software jointly developed by Texas A&M and SCS.

Mr. James Featherston, Soil Conservationist, has been a most active leader and organizer of SCS participation. Gary Westmoreland, State Resource Conservationist demonstrated a commitment to staff computer use education, resulting in SCS becoming a primary recipient of the education provided by the project.

2.3 Software Development

A major objective of the project was to use funds provided by W.K. Kellogg to complement Texas Agricultural Experiment Station and contract funding for decision aid software development.

At the end of the project period, 32 coded programs and 9 packages of spreadsheet templates with 98 templates were completed and being distributed. Four other programs are in the final stages of completion. In addition, programs completed in the Entomology Department were assisted with project funding. Due to the contibution of other funding sources, all the software development is not directly the result of the project. However, the availability of W.K. Kellogg funding provided the majority of programming resources so critical for this type of activity. Appendix C lists the computer software available from the Texas Agricultural Extension Service.

2.4 Acquisition of Microcomputer for Staff

Computers provided by Texas Instruments Incorporated were placed in eight subject matter areas in the College of Agriculture on the Texas A&M Campus. These computers enhanced the computer education activities in these departments and led to a number of programs developed for distribution in Entomology and Agricultural Engineering.

2.5 Private Sector Software Vendor Support

The Texas Agricultural Extension Service and Texas Agricultural Experiment Station have made a commitment to support private software vendors in agriculture. This support includes education of computer users, demonstration of private sector software, and informing users about different sources of private sector software to meet different user needs. An effort is also made to not develop software that unfairly competes with private sector products. Most software developed and distributed from Texas A&M falls into the decision aid classification, and complements private sector efforts in accounting and record keeping.

As a result of this project and the policy of Texas A&M, private sector support has been outstanding. Over $80,000 of software has been donated to

support the project. Private sector software is used in the Stiles Farm MIS's accounting activities, livestock production records, and field records. Private software is also used in most of the educational activities. The project has one of the most complete agricultural software libraries in the country with software from all major agricultural software firms on display. Appendix D identifies the most active current software vendors contributing to the project.

Private vendors have also participated in education activities at the Stiles Farm Computer Training Center. Their explanation and demonstration of software have improved both Texas A&M staff and user understanding of the capability of their products.

Support of the private sector has been beneficial to participating vendors. Texas A&M staff have offered suggestions for enhancement of software and communicated experiences gained through use of the software that have helped improve products. There is no doubt that the cooperative effort has enhanced sales of private sector software in Texas and has led to a better support for farm and ranch users in Texas.

2.6 Staff Participation

Many Texas A&M staff and students participated in and received resources from the project. Appendix E lists those whose contribution can be clearly identified as part of the ongoing part of the project efforts and who will continue supporting the project.

This group included twenty research and extension staff, three systems analyst, seven graduate students, the project secretary, and two Stiles Farm computer coordinators. Staff and students represented seven different departments at Texas A&M University. A number of other departments received graduate student funding and computer hardware support that enhanced these ongoing efforts, but did not lead to applications at the Stiles Farm.

2.7 Electronic Applications Tested

Electronic Weather Station

One of the innovative data generation and transfer technologies made practical is an electronic weather station set up at the Stiles Farm under direction of William Dugas. This station has worked flawlessly and has received national attention in the farm computer press.

The following are the current and projected uses by TAEX specialists of the weather data from the Stiles Farm weather station:

Dr. Bob Metzer - Cotton Specialist
- Accumulated heat units to develop a model to predict cotton maturity in the Central Blacklands
- Soil temperature to determine optimum planting time
- Precipitation data to evaluate fruiting form maturity and relate precipitation to fiber quality

Dr. Cloyce Coffman - Sorghum and Corn Specialist

- Accumulated heat units and soil temperature to be used in the demonstration of optimum planting date
- Precipitation data to evaluate effect of precipitation on corn maturity

Chris Sansone - Area Entomologist

- Accumulated heat units to time application of defoliants and desiccants on cotton
- Validate Commyx/Gossym model for Central Blacklands
- Validate TEXCIM (mothCV and fleahopper model)

Other Electronic Application Tested

One of the limitations of farm information systems is the human effort and cost associated with data collection and the transfer of that data into the computer for processing. Several applications of electronic technology for this activity were tested at this farm. These include: (1) data logger use as a substitute for hand-written data collection; (2) infrared data transmitters for the swine record system; (3) electronic collecting of pest counts, primarily for use in insect control for cotton; and (4) a computer monitored tractor.

The experience and interest generated in these applications has been very beneficial. The practicality of the technologies was well tested and will reduce the risk of these applications and guide future development. A key to successful electronic data collection lies in developing software that interfaces well and that facilitates error checking with automated data entry. Many applications of the electronic monitoring of tractor performance will no doubt be utilized in future tractors used in agriculture.

Miscellaneous Impacts

Many of the computer applications, software donated by the private firms and software developed through the project are used in an advanced farm management course. This Agricultural Economics course developed by Drs. Edward Rister, Rod Martin and Ron Kay helps students use the computer in simulated management environments preparing them for employment in management positions.

Part of the W.K. Kellogg grant funds were provided to Dr. Wallace Killcreas at Mississippi State University to enhance catfish management software. This software is being used at the Stiles Farm and distributed by Mississippi State University. Both institutions software development efforts were enhanced by this cooperative effort.

3.0 Information Dissemination on Activities and Results

Documentation of information about the project had a number of important goals including: (1) attracting attention of a wide audience of potential

funding participants, (2) fostering the progressive agricultural technology image of the Stiles Farm Foundation and the Texas A&M System, (3) attracting participants in education and demonstration activities, and (4) enhancing the ability of Extension to facilitate improved management through subject matter education and computer use of staff and clientele. Information on the activities and results of the project were disseminated through press releases, Stiles Farm Field Days, specialized publicity releases on the project and courses, software distribution, and national and international presentations and publications.

3.3 Press Articles on the Project

Through very intense efforts of Dr. William Braden, Extension Communication Specialist of the Texas A&M Agricultural Communication Department and Jan Corey Arnett, Communication Associate of the W.K. Kellogg Foundation, the press releases on the project were numerous.

Listed in Appendix F are references to 21 of the articles that were published on the project. Many of these articles were published nationally bringing recognition to the project and Stiles Farm Foundation.

3.4 Stiles Farm Field Days

The annual field day at the Stiles Farm attracts approximately 1000 participants, including Texas A&M Extension and research staff from the local area and state specialists. Each year of the project a special field day topic area featured the computerized farm project. This demonstration activity has been very effective as it provided a full spectrum of computer applications from management, to home economics, to computerized tractors, and even to children playing games. Many extension county staff and specialists participate, so this truly presents an opportunity to be involved and see many applications. The visibility of the whole effort was extremely high as the audience includes the farm press, legislators, agribusiness representatives, members of the board of regents and campus based administrators who do not frequently see agriculture research - extension efforts operational in on-farm applications.

3.5 Presentation on Project Activities

Due to the uniqueness of the "Year 2000 Computerized Farm Project" many opportunities were afforded in national and international conferences to present information on the project. Described below are eight national and four international activities.

Presentation on the project activities were presented in national meetings including:

- Texas A&M University System Symposium, October 11, 1984
- Southern Regional Extension Computer Conference, Mississippi State University, October 16-17, 1984
- Agricultural Computer Association Annual Meeting, Visalia, California, November 15-16, 1985

- On-Farm Computer Use - Conference and Trade Show, Purdue University, November 18-20, 1984
- Illinois Farm Computer Conference, Springfield, Illinois, November 27, 1985
- The Florida International Conference on Computer Use in Agricultural Extension Programs, 1986
- The 1986 Annual Meeting of the American Agricultural Economics Association, Reno, Nevada
- A National Farming System Workshop sponsored by ECOP, St. Louis, 1986

In each of these meetings, papers were presented on the project activities and experiences to facilitate other professional efforts to apply microcomputer technology to improve farm and ranch management. Papers presented are among those listed in Appendix G.

The development and implementation of the project was described to international audiences in Austria, Australia, Peru and Costa Rica. A total of 57 countries were represented in these conferences. Presentations during these conferences focused on software development procedures, meeting educational needs and how the on-farm application could facilitate development and education activities.

During the project period, four television and five radio programs highlighted the project. The most comprehensive program was developed in September, 1984 by the Iowa Public Service TV under the direction of Linda Wright. This program was broadcast nationally. Most of the television and radio programming took place during field days and provided a positive image of real world computer applications.

4.0 Evaluation of Results

The project can be evaluated in the three major areas of work including (1) Stiles Farm information system development, (2) education and demonstration and (3) software development and distribution.

Effect on Stiles Farm Profits

One of the goals of the organizers of the "Year 2000 Computerized Farm Project" was to make the MIS increase net farm income by $10,000 per year. Increased income could be from cost savings through improved decision making, making fewer mistakes, or choosing more profitable options. Putting dollar values on improved decision making through use of the MIS is not simple because of the interaction between decision on farms and the difficulty of measuring the contribution of improved information to improved decision making.

Several areas of change on the Stiles Farm have, however, led to direct increased income facilitated by the use of information from the MIS.

- Improve culling and production management in the swine herd.
- Selection of cattle enterprises and marketing decisions.
- Improve machinery purchase decisions.
- Elimination of the unprofitable catfish hatchery activity.
- General overall awareness of enterprise costs and returns and forward

budgeting has lead to better cost control.

Each of these areas identified contributed to net farm income. Increased income goals were surpassed. The installed MIS will continue to provide management information to enhance decision making.

Short Course Evaluation

A group of farm and ranch owners and managers that participated in the three day short courses between January, 1985 and October, 1986 were surveyed to determine the characteristics of course participants and the course effectiveness. A total of 83 participants were surveyed, with 46 percent returning useable questionnaires. Summarized below are some of the major findings from the survey.

Participants' Characteristics

The average education level of participants was slightly more than a college education (4.1 years). Only ten percent did not have some college education, and almost a third had more than 4 years of education beyond high school.

The farm or ranch business participants, for the most part, represented large operations with 72 percent reporting gross incomes in excess of $100,000 and 28 percent in excess of $250,000.

On a scale of 1-10, the respondents considered their information user capability was above average (average value of 6.6).

Participants were thus well educated, were involved in large farming or ranching business, and were good information users. Courses were targeted toward this commercial agricultural level and effectively attracted the target audience.

Course Evaluation

On a scale of 1 to 10 the average ranking of the short course as a useful education experience was 8.4. Over half of the "respondents" ranked the course as 9 or 10. There were three evaluations of five or below. These individuals indicated in general that the courses were too intensive and perhaps beyond their skill level., One rated the Lotus 1-2-3 course low, but he did not own the Lotus software[1]. Two participants had non-compatible Apple computers and rated the course quite low. To the majority, the computer system used in education was appropriate given the availability of agricultural software.

Progress was made throughout the project on information flows to potential participants on course content and systems used, reducing the dissatisfaction level.

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[1] Lotus 1-2-3 is a trademark of the Lotus Development Corporation.

Cost and Returns

It was important to establish the costs and returns that participants identified with the courses. The average cost of participation was $443 for the thirty-six respondents to the cost question. This cost would include course fee, travel and lodging. Seventy-eight percent indicated that added returns were greater than costs. There was some reluctance to indicate the added return above the course cost, but of the 17 respondents to this question, they estimated that returns were increased an average of $3,247 as a direct result of the course. Participants in the most recent courses logically did not respond to the question as added value of the training tends to accumulate over time. One can certainly conclude the investment in the course is quite profitable. The seventeen respondents that indicated returns above course costs average $6.63 of returns for every dollar spent attending the training. Few investments in agriculture will earn this rate of return.

Respondents indicate that the most important part of the course was learning the subject matter that went with the operating and software use. Learning how to use the computer was listed as the least important part of the course. Over time, courses have evolved to recognize that subject matter knowledge is the most limiting factor in profitable computer use.

Computer Hardware, Software and Use

Respondents were asked to describe their computer systems. Seventy nine percent had hard disks, sixty eight percent color monitors, all had printers, but only twenty-six percent had a modem. The IBM computer was most frequently owned, 37%, followed by Compaq, 18%, and Texas Instruments, 18%[2]. The choice of the systems is consistent with the availability of agriculture information. The average cost of the computer system for respondents was $5,889.

The most important single software package respondents use is Lotus 1-2-3. Sixty-eight percent of the respondents owned the program. Seventy-four percent of them used software developed by the Texas Agricultural Extension Service and Experiment Station. Much of this decision aid software used was developed with project support. The second most important type of commercial software used was various accounting packages.

The respondents on the average use the computer eleven hours a week. They ranged from 1 to 40 hours, with 26 percent indicating use of 20 hours or more weekly.

4.3 Software Distribution

The availability of the software generated through support of the project has been well communicated and large numbers of the programs have been distributed. This can be illustrated through recent distribution information. The January 1987 issue of the Texas Agricultural Extension Service catalog was distributed to over 2000 clientele and extension staff. During the 1985-86 fiscal year, 800 programs or spreadsheet template sets were supplied to clientele in Texas and 340 were sent out of state. More than 4000 copies of

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[2] IBM is a trademark of International Business Corporation.

programs and templates were supplied to Extension Staff in Texas who use the software with clientele. Although the majority (60 percent) of the software distributed is presently from the farm and ranch management group the distribution system is now in place to facilitate participation by other extension and research staff at Texas A&M. Software development and distribution has been accelerated through the project effort.

Microcomputer Use by Staff

Through Texas Instruments Incorporated support of the Computerized Farm project, eight subject matter areas received microcomputers. Identified below are the areas where the computers were located and the primary use of the computer in light of the project objectives.

	Number of Computers	Use[3]
Agricultural Economics		
Farm Management	9	S,E,R
Marketing	1	E,R
Veterinary Medicine		S
Soil and Crop Science	1	E
Agricultural Engineering	2	S,E,R
Animal Science	1	E
Entomology	1	S
Wildlife and Fisheries	1	S,E,R
Stiles Farm Training Center	11	E
Stiles Farm Offices	3	F
TAEX Administration	1	E

[3] Software Development (S), Staff Education (E), Software review for project (R), and Farm Use (F).

There is no doubt that the computers increased the overall capacity of staff to use microcomputers in educational activities.

Ninety-five percent of the agriculture decision aid software presently distributed by the Texas Agricultural Extension Service was developed or tested on the computers provided through the project effort.

5.0 Continuation of Project Activities

One of the objectives of the project effort was to insure activities would continue and expand after completion of the project. A number of efforts have been made to insure activities will continue, including operation and enhancement of the on-farm computerized information system (MIS), continued short course activities and software distribution and maintenance.

The Texas Agricultural Extension Service has insured that the Stiles Farm's MIS will continue by providing funding for one-third time of a farm management position at the farm and providing a multidisiplinary management consultant group made up of Extension specialists that will use and enhance the MIS on a continual basis. New applications developed by the Extension and research staff will be tested and demonstrated at the Stiles Farm. Development of the MIS at the Plantation Farm will also enhance the further development of

the Stiles Farm MIS.

With the building of the training center at the Stiles Farm, a permanent education facility was built. Course user fees are used to maintain facilities and to cover direct course costs. Computers are maintained by TAEX. Based on the level of participation in courses and staff training, the training center is in a strong position for long term, self sustaining support.

A software distribution unit is well established in the Texas Agricultural Extension Service. Software will be maintained by the developing departments through use of current operating funds. Funds generated through modest distribution fees are adequate to cover distribution of software updates.

Support for the ongoing and future activities by TAEX insured this will be an ongoing effort that will contribute to future computer applications in agriculture for many years.

Appendix A. Microcomputer Application Grants, Contracts and Gifts Received

	Sources	Product	Amount
1.	DOW Chemical	Range Software	$ 5,000
2.	W.K. Kellogg	Year 2000 Computerized Farm Grant	$ 500,000
3.	Texas Instruments, Inc.	Year 2000 Computerized Farm Grant	$ 285,000
4.	Private Agriculture Software Vendors Gifts	Year 2000 Computerized Farm Grant	$ 80,000
5.	Omni Data	Data Logger Gift	$ 6,700
6.	DOW Chemical	Range Software Conversion	$ 5,000
7.	Stiles Farm Foundation	Training Center	$ 35,000
Total Grants and Contracts			$ 916,700

APPENDIX B.

STILES FARM TRAINING CENTER VISITORS

JUNE 12, 1984 - DECEMBER 31, 1984

DATE	GROUP	NUMBER OF PARTICIPANTS	PEOPLE-DAYS
06/12/84	STILES FARM FIELD DAY	100	100
06/15/84	AG ECON DEPT - TAMU	9	9
07/25/84	FORESTRY WORKSHOP	5	5
08/08/84	RANGE SPECIALIST COMPUTER WORKSHOP	7	7
08/14/84	BELL COUNTY PRODUCER	1	1
08/15/84	NOLAN COUNTY PRODUCER	1	1
10/12/84	WILLIAMSON COUNTY PRODUCER GROUP	5	5
11/28/84	CHEMICAL BUSINESS OWNER	1	1
12/01/84	MEAT SPECIALIST	1	1
12/04/84	MILAM COUNTY PRODUCER GROUP	15	15
12/04/84	WILLIAMSON COUNTY PRODUCER	1	1
12/18 - 12/20/84	ANIMAL SCIENCE SPECIALISTS	5	15
	1984 TOTALS	151	161

STILES FARM TRAINING CENTER VISITORS

JANUARY 1, 1985 - DECEMBER 31, 1985

DATE	GROUP	NUMBER OF PARTICIPANTS	PEOPLE-DAYS
01/22 - 01/24/85	FARM ACCOUNTING WORKSHOP	5	15
01/24/85	FURROW MAGAZINE EDITOR	1	1
01/28/85	LULING FOUNDATION REPRESENTATIVES	2	2
01/29/85	FIRST TAYLOR NATIONAL BANK LENDERS	2	2
02/12 -02/14/85	SPREADSHEET WORKSHOP	12	36
02/19/85	WALLER COUNTY PRODUCERS	3	3
02/21/85	CIBA-GEIGY REPS (SWITZERLAND)	2	2
03/08/85	BELL COUNTY PRODUCER	1	1
03/14/85	WILLIAMSON COUNTY PRODUCERS	2	2
03/27/85	SCS OFFICIALS (WASHINGTON, D.C.)	10	10
03/28/85	BRAZILIAN GOVT. AG OFFICIAL	1	1
04/02/85	AUSTIN AG SOFTWARE DEVELOPER	1	1
04/05/85	OMNIDATA REPRESENTATIVE	1	1
04/16 - 04/18/85	BEEF CATTLE PERFORMANCE SHORT COURSE	9	27
04/24 - 04/26/85	SPREADSHEET WORKSHOP	11	33
04/25/85	JOHN DEERE REP	1	1
05/02/85	FCIC REPS W AG CONSULTANT	3	3
05/06/85	HOME ECONOMIST	1	1
05/07 - 05/09/85	FARM ACCOUNTING WORKSHOP	9	27
05/13/85	HOME ECONOMICS SPECIALISTS	8	8
05/20/85	MICHIGAN STATE UNIV CROP SCIENTIST	1	1
05/29 - 05/31/85	MBMS SEMINAR	12	36
06/19/85	FARM FIELD DAY PARTICIPANTS	950	950
06/20/85	MICHIGAN STATE UNIV REPS	5	5
06/21/85	DIGITAL RESEARCH REPS	2	2
06/26/85	FOREIGN GOVT AG OFFICIALS (JACKMAN)	15	15

07/09/85	SCHLIECHER COUNTY PRODUCER	1	1
07/18/85	ROBERTSON COUNTY PRODUCER	1	1
07/30 - 08/01/85	RISK MGMT WORKSHOP - CEA	8	24
08/05/85	COUNTY AGENT ASSN TOUR	75	75
08/05/85	CHANNEL 7 TV NEWS (AUSTIN)	2	2
08/06/85	CIBA GEIGY REP (SWITZERLAND)	1	1
08/13/85	HOME ECONOMICS SPECIALISTS	2	2
08/15/85	SWINE SPECIALIST	1	1
08/19/85	AUSTRALIAN COTTON GROWER GROUP	12	12
08/19/85	PUERTO RICAN UNIVERSITY OFFICALS	2	2
08/23/85	HOUSTON COMPUTER SALESMAN	1	1
08/28 - 08/30/85	RISK MGMT WORKSHOP - CEA	7	21
09/10 - 09/12/85	ANIMAL SCIENCE SPECIALUST GROUP	7	21
09/16/85	2 NAVARRO COUNTY PRODUCER	2	2
09/18/85	WACO COMPUTER DEALER	1	1
09/24/85	FARM MAGAZINE REPORTER	1	1
10/09/85	FIELD DAY PLANNING MEETING	19	19
10/15 - 10/17/85	SPREADSHEET WORKSHOP	11	33
10/29 - 10/31/85	ACCOUNTING WORKSHOP	18	54
10/30/85	DATASPHERE REP	1	1
11/20/85	SWINE RECORD ANAYLSIS COURSE	12	12
11/12/85	AG ACCOUNTING CONSULTANT	1	1
11/15/85	AG ACCOUNTING CONSULTANT	1	1
11/27/85	2 BRAZOS COUNTY PRODUCERS	2	2
		---	----
	1985 TOTALS	1259	1477

STILES FARM TRAINING CENTER VISITORS
JANUARY 1, 1986 - DECEMBER 31, 1986

DATE	GROUP	NUMBER OF PARTICIPANTS	PEOPLE-DAYS
01/03/86	WALLER COUNTY PRODUCER	1	1
01/03/86	TAYLOR BUSINESSMAN	1	1
01/20/86	COMPUTER USER GROUP	7	7
01/21 - 01/22/86	SCS SPECIALISTS	11	22
02/03/86	COMPUTER USER GROUP	7	7
02/04 - 02/06/86	SPREADSHEET SHORT COURSE	8	24
02/10/86	COMPUTER USER GROUP	4	4
02/12/86	3 FLOYD COUNTY PRODUCERS	3	3
03/04 - 03/06/86	COLLIN COUNTY PRODUCER	1	3
03/21/86	3 SPERRY-RAND REPS	3	3
03/25 - 03/27/86	BEEF CATTLE PRODUCER SHORT COURSE	5	15
03/31/86	AG ECON CLUB TAMU	9	9
04/08 - 04/10/86	BEEF CATTLE PRODUCER SHORT COURSE	7	21
04/10/86	COMPUTER USER GROUP	8	8
04/15/86	COTTON EXPERT SYSTEMS GROUP	9	9
04/17/86	ECOP COMMITTEE	6	6
04/18/86	2 AUSTRALIAN PRODUCERS	2	2
04/22 - 04/24/86	FARM ACCOUNTING SHORT COURSE	7	21
05/07 - 05/09/86	BEEF CATTLE HERD HEALTH SEMINAR	18	54
05/13/86	COTTON EXPERT SYSTEM GROUP	8	8
05/20 - 05/22/86	ADVANCED SPREADSHEET SHORT COURSE	19	57
05/22/86	UNIV OF MINNESOTA - EXT AG ENG	1	1

06/03 - 06/05/86	FARM ACCOUNTING COURSE	3	3
06/05/86	HOUSTON AG CONSULTANT	1	1
06/05/86	ROCKDALE HUMAN RESOURSES CONSULTANT	1	1
06/11/86	COTTON EXPERT SYSTEM GROUP	8	8
06/17/86	STILES FARM FIELD DAY	115	115
06/18/86	JOHN DEERE REP TRAINING	9	9
06/19/86	FALLS COUNTY PRODUCERS	8	8
06/27/86	COTTON EXPERT SYSTEM GROUP	8	8
07/01 - 07/03/86	LOTUS MACRO COURSE	9	27
07/01/86	FURROW MAGAZINE REPORTER	1	1
07/01/86	DOW CHEMICAL REP	1	1
07/03/86	ROCKDALE STUDENT GROUP	6	6
07/07/86	WILLIAMSON COUNTY CHEMICAL DEALER	1	1
07/10/86	STOCKER CATTLE BUDGETING COURSE	17	17
07/14/86	ISRAELI EXTENSION DIRECTOR	1	1
07/15 - 07/17/86	RICE PRODUCERS SHORT COURSE	15	45
07/21 - 07/24/86	ARTIFICIAL INTELLIGENCE COURSE	9	36
08/20/86	ARGENTINE PRODUCER GROUP	7	7
09/16/86	2 BELL COUNTY FARM ACCOUNTANTS	2	2
09/18/86	COLORADO COUNTY CROPS TOUR	45	45
09/23 - 09/25/86	BEEF CATTLE SHORT COURSE	15	45
09/26/86	2 MADISON COUNTY PRODUCERS	2	2
10/21 - 10/23/86	SPREADSHEET COURSE	19	57
10/27/86	UT RESEARCHER	1	1
10/28 - 10/30/86	DOW CHEMICAL TRAINING	8	24
10/27/86	UT RESEARCHER	1	1
12/ 3/86	PALACIOS PRODUCER & DEALER	2	2
12/ 9 - 12/11/86	ACCOUNTING SHORT COURSE	9	27
	1986 TOTAL TO DATE	477	742

Appendix C. Software Development

Coded Software Presently Distributed

1. Agricultural Loan Analysis (AAB)
2. Calculating Loans Unknown (AAC)
3. Calculating Future Value/Present Value (AAF)
4. Net Present Value, Internal Rate of Return (AAQ)
5. Financing Land Sale Analysis (AAD)
6. Financing Land Purchase Analysis (AAE)
7. Breakeven Price or Yield for Alternate Crops (AAK)
8. ARCIE - Agricultural Risk Crop Insurance Evaluator (ABX)
9. Harvest Time Grain Marketing Decisions (ABE)
10. Microcomputer Budget Management System (MBMS)
11. Irrigation Fuel Cost Calculation (AAH)
12. Irrigated vs. Dryland Crop Production (AAU)
13. Calculating Irrigation Capacity Unknowns (AAL)
14. Irrigation Pumping Plant Fuel Efficiency (AAR)
15. 205 Day Weaning Weight and Performance Analyzer (AAN)
16. Fencing Cost Calculator (AAV)
17. Deer Hunting Enterprise Economic & Production Evaluator (AAG)
18. Stocker Cattle Production/Marketing Analysis (AAZ)
19. Cow-Calf Economic & Production Evaluation (ABA)
20. Angora Goat Economic & Production Evaluation (ABB)
21. Sheep Economic & Production Evaluation (ABC)
22. Spanish Goat Economic & Production Evaluation (ABG)
23. Stocker Cattle Enterprise Economic & Production Evaluation (ABL)
24. Stocker Lamb Enterprise Economic & Production Evaluation (ABN)
25. Mutton Angora Goat Economic & Production Evaluation (ABO)
26. Range and Land Improvement Cost Calculator (ABH)
27. Whole Ranch Summary (ABM)
28. Motor Vehicle Cost Analysis (AAA)
29. Pickup and Trailer Cost Analysis (AAT)
30. Combine Ownership vs. Custom Hire After Tax (AAP)
31. Machinery Cost Estimator (ABD)
32. Pecan Nut Casebeayer Model (Act-6)

Code Software Being Tested or Programming Completed

1. Range Livestock Management Information System
2. Range Livestock Ration Formulator
3. Machinery Management Record System
4. Crop Leasing Arrangement Evaluator

Spreadsheet Software Distributed

Title of Package	Number of Templates
1. Agricultural Financial Statements & Analysis Templates	4
2. Cattle Herd Growth, Forage Production Balance or Economic and Financial Projection Templates	8
3. Enterprise Budget Templates	10
4. Ranch Financial Statements and Analysis Templates	11
5. Grazing and Ranch Management Worksheet	14
6. Machinery Management Decision Aids	8
7. Range Livestock, Forage and Total Ranch Budgeting Templates	28
8. Decision Aids for Citrus Grove Budgeting and Investment Analysis	12
9. Hay Storage Cost Evaluator	3
Total Templates	98

Appendix D. Agricultural Software Vendors Actively Involved in Project

Control Data Corporation
Doane Information Services
2001 Killebrew Dr., Suite 333
Bloomington, MN 55420
800-422-2434

Datasphere Computer Systems, Inc.
6443 S.W. Beaverton-Hillsdale Highway, Suite 305
Portland, OR 97221
503-297-9035

FBS Systems
P.O. Box 248
Aldeo, IL 61231
309-582-5628

Great Plains Small Business Software
1701 S.W. 38th
Fargo, ND 58103
1-800-345-3276

Harvest Computer Systems, Inc.
120 N. Harrison
Alexandria, In 46001
317-724-9527

High Plains Systems
P.O. Box 8152
Amarillo, TX 79109
806-358-7101

Red Wing Business Systems
610 Main Street
Box 19
Red Wing, MN 55066
612-388-1106

Appendix E. Staff and Student Participation in the Project

Name	Department
Dr. Lawrence Lippke	Agricultural Economics
Dr. Ernest Davis	Agricultural Economics
Mr. Henry P. O'Neal	Agricultural Engineering
Mr. Roy Childers	Agricultural Engineering
Dr. Bill Stout	Agricultural Engineering
Mr. Don Steinbach	Wildlife & Fisheries Science
Dr. Cloyce Coffman	Soil and Crop Sciences
Dr. Robert W. Field	Veterinary Medicine
Dr. Gary Rupp	Veterinary Medicine
Dr. John Jackman	Entomology
Dr. Walter Walla	TAEX Administrative Staff
Dr. William Dugas	Ag. Meteorology, Blackland Research Center
Mr. Chris Sansone	Entomology
Dr. William Braden	Agricultural Communications
Dr. Stephen Amosson	Agricultural Economics
Dr. Gerald Cornforth	Agricultural Economics
Dr. Wayne Hayenga	Agricultural Economics
Dr. Danny Klinefelter	Agricultural Economics
Dr. Tom Knight	Agricultural Economics
Dr. Ashley Lovell	Agricultural Economics
Mr. Richard Patterson	Agricultural Economics
Mr. Jose G. Pena	Agricultural Economics
Dr. Jackie Smith	Agricultural Economics
Dr. Kenneth Stokes	Agricultural Economics
Mr. Delton Gerloff	Agricultural Economics
Students, Programmers, and Support Staff	
Mr. Jeff Johnson	Agricultural Economics
Mr. Robert Dyer	Agricultural Economics
Mr. Tim Powell	Agricultural Economics
Mr. Jay Yates	Agricultural Economics
Mrs. Jeanne Richardson	Agricultural Economics
Mr. David Riegel	Agricultural Economics
Mr. Alan Davis	Agricultural Economics
Mr. Robert Jenson	Agricultural Economics
Mr. Clay Laird	Systems Analyst, Consultant
Mrs. Rosemary Schoenfeld	Project Secretary
Mr. Bill Bobacz	Agricultural Engineering
Mrs. Jeanie Grogan	Computer Technology

Appendix F. Press Articles Written on the Year 2000 Computerized Farm Project

"Microcomputers Can Help Agriculture Procedures Manage More Efficiency and Effectively." The Cotton Gin and Oil Mill Press, June 12, 1982.

Pigg, Calvin. "For Field Efficiency-Computer-Assist Tractors Make Gains." Southwest Farm Press, Page 28, April 28, 1983.

Braden, William F. "'Computerized Farm' Project Launched." News, Texas Agricultural Extension Service, December 7, 1983.

Braden, Bill. "Computerized Project Launched." Extension Today, Texas Agricultural Extension Service. The Texas A&M University System. Volume 3, No. 2, January 1984.

"'Computerized Farm' to Cost $1.2 Million." Southwest Farm Press, Page 34, January 12, 1984.

Braden, Dr. Bill. "Texas A&M Launches Project to Create 'Computerized Farm,'" Ag-Computer Digest, No. 10, February 1984.

"Computerized Farm Project Launched.' Computer Circuit, Volume 1, Issue 2, Page 8, March 1984.

Pigg, Calvin. "Computerized Tractor Gets Season Test." Southwest Farm Press, Pg. 20, March 15, 1984.

"Stiles Farm Field Day to Feature Computers." Livestock Weekly, Page 15, June 14, 1984.

"Computerized Farm." The Eagle, June 19, 1984.

Pigg, Calvin. "Computer-Run Training Farm WIll Offer Short Courses." Southwest Farm Press, Page 12, July 5, 1984.

Year 2000 Computerized Farm. Texas Agricultural Extension Service, The Texas Agricultural Experiment Station, The Texas A&M University System, September 1984.

Ray, Randy. "From Cotton to Fish Farming Talking Computers Improve Efficiency." Temple Daily Telegram, Page 7B, June 19, 1985.

"Cooperative Extension and Electronic Technology--New Initiatives in Information Delivery, Education Delivery, and Problem Solving." United States Department of Agriculture - Extension Service, September 1985.

O'Brien, Kelly. "Farming in the future-Computerized farm on line in Texas." Farm Computer News, Page 10, Jan/Feb 1986.

Arnett, Jan Corey. "Cattle, Crops, and Computers." Profiles, W.K. Kellogg Foundation, Battle Creek, Michigan. Volume 9, Number 3, Pages 8-10, Fall 1986.

"Computer Courses Offered." Texas Agriculture, Texas Farm Bureau, Vol. 2, No. 4, Page 15N, September 5, 1986.

"Farm's computer schools put emphasis on economics." High Plains Journal, Oklahoma and Texas Edition. October 6, 1986.

"Growing technology on the farm." IBM Information Processing, Volume 4, No. 4, Pages 16-25, Winter 1986.

"Thinking Computers." Farm Industry News, Volume 20, No. 1, Page 85, January 1987.

Appendix G. Software and Microcomputer Application Related Publications

1. Refereed Journal Articles

McGrann, James M. "Microcomputer Software Development and Distribution," Southern Journal of Agricultural Economics, Vol. 15, July 1983.

McGrann, James M. Timothy Powell, Kent Olson and Ted Nelson. "Microcomputer Budget Management System," Southern Journal of Agricultural Economics, Vol. 18, No. 1, July 1986.

2. Other Publications

McGrann, James M. "Microcomputer Software Development for the End User," ECOP, Electronic Technology Task Force Committee, Tucson, Arizona, January 1984.

McGrann, James M., Kent Olson and Ted Nelson. "The Microcomputer Budget Management System," Contributed Paper, Southern Agricultural Economics Association annual meeting, Nashville, February 1984.

McGrann, James M. "Getting the Most Out of Your Electronic Spreadsheet Lotus 1-2-3". American Soybean Association Expo, San Antonio, Texas, August 1985.

McGrann, James M. and Alan Davis. "Farm Management Software Design and Documentation Procedure," Proceedings of the International Conference on Computers in Agriculture Extension Programs, Florida Cooperative Extension Service, University of Florida, Gainesville, February 1986.

Powell, Timothy A. and James M. McGrann. "Potential Applications of Expert Systems in Farm and Ranch Management," Proceedings of the International Conference on Computers in Agriculture Extension Programs, Florida Cooperative Extension Service, University of Florida, Gainesville, February 1986.

McGrann, James M. "Stocker Cattle Production/Marketing Analysis," Proceedings of the International Conference on Computers in Agriculture Extension Programs, Florida Cooperative Extension Service, University of Florida, Gainesville, February 1986.

McGrann, James M., M. Edward Rister, Thomas O. Knight, and Gregory M. Perry. "Moving Toward A Whole-Farm Decision-Support System," Proceedings of the International Conference on Computers in Agriculture Extension Programs, Florida Cooperative Extension Service, University of Florida, Gainesville, February 1986.

McGrann, James M. and Jeffery Johnson. "year 2000 Computerized Farm Project: A Progress Report," Proceedings of the International Conference on Computers in Agriculture Extension Programs, Florida Cooperative Extension Service, University of Florida, Gainesville, February 1986.

McGrann, James M. "Issues Related to Microcomputer Agricultural Software Design and Distribution in Developing Countries". Salzburg Seminar, Section 240, Austria, April 1986.

McGrann, James M. and Jeffery W. Johnson. Year 2000 Computerized Farm Project: Creating an Extension Management Education Environment". Department of Agricultural Economics, Texas A&M University, College Station, Presented at the American Agricultural Economics Association Meeting, Reno, Nevada, July 1986.

McGrann, James M. "Sheep and Goat Enterprise Budgets". Department of Agricultural Economics, Texas A&M University, Presented at the Sheep and Goat Raisers Field Day, San Angelo, Texas, September 1986.

McGrann, James M. "Microcomputer Selection and Uses in Beef Cattle Management," L-2208, Texas Agricultural Extension Service, Texas A&M University System, November, 1986.

McGrann, James M. "Management Information System for the Farm Level," Proceedings for the National Farming System Workshop: Pending Publication, University of Minnesota Cooperative Extension Service, St. Louis, November, 1986.

3. Agricultural Engineering Publications

Morris, D., J. Grogan, S. Searcy, H. Wiedemann, A. Low, and B. Stout. "Potential Fuel Savings Using a Tractor Operator Feedback System," ASAE Paper No. 84-1077, presented at the University of Tennessee, June 24-27, 1984.

Morris, D. "Microcomputer Based On-Board Tractor Performance Monitor," M.S. Thesis, 1984.

Babacz, William A. "Mechanical Front Wheel Drive Tractor: A Field Performance Study, M.S. Thesis, August 1986.

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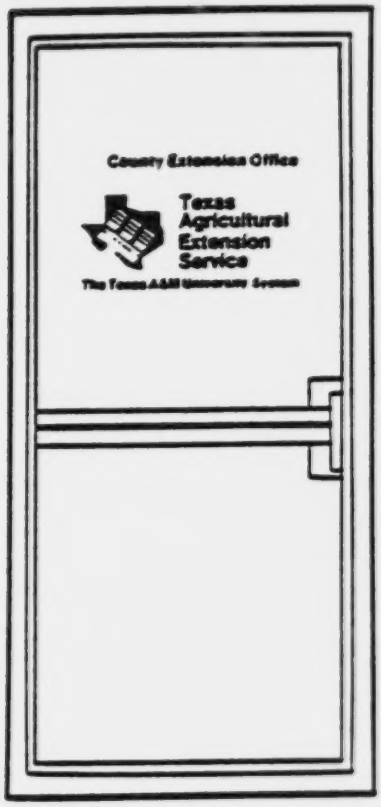

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